

WHAT IS CLAIMED IS:

1. A method of manufacturing an active cooling panel, the method comprising the steps consisting in providing a first
5 part of thermostructural composite material having an inside face presenting indentations forming channels, forming a metal coating on said face of the first part, providing a second part of thermostructural composite material having an inside
10 face for application on said inside face of the first part, forming a metal coating on said inside face of the second part, and assembling the first and second parts together by bonding said inside faces together, thereby obtaining a cooling panel of thermostructural composite material having integrated fluid flow channels,
15 wherein the parts are assembled together by bonding said inside faces together by hot compression.
2. A method according to claim 1, wherein the bonding is implemented by hot isostatic pressing.
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3. A method according to claim 1, wherein the bonding is implemented by pressing the parts in a hot press.
4. A method according to claim 1, wherein for the bonding by
25 hot compression use is made of at least a portion of the metal coatings formed on said inside faces of the first and second parts.
5. A method according to claim 1, wherein for the bonding by
30 hot compression, a metal foil is interposed between said inside faces of the parts provided with metal coatings.
6. A method according to claim 1, wherein the metal coatings are formed by forming first and second superposed deposits,
35 the first deposit having a function of forming a reaction barrier between the components of the thermostructural

composite material and the second deposit, and/or a function of matching thermal expansion, and the second deposit contributing to bonding between the parts by hot compression.

- 5 7. A method according to claim 6, wherein the first deposit is selected from rhenium, molybdenum, tungsten, niobium, and tantalum.
- 10 8. A method according to claim 6, in which the first and second parts for assembling together are made of composite material including silicon, wherein the first deposit is of rhenium.
- 15 9. A method according to claim 4, wherein the metal of the metal layer enabling bonding by hot compression is selected from nickel, copper, iron, and an alloy of at least one or more thereof.
- 20 10. A method according to claim 4, wherein the metal enabling bonding by hot compression is selected from nickel and a nickel-based alloy.
- 25 11. A method according to claim 1, wherein the metal coating is formed at least in part by physical vapor deposition.
12. A method according to claim 1, wherein the metal coating is formed at least in part by plasma sputtering.
- 30 13. A method according to claim 1, wherein said inside faces of the parts are provided with metal coatings by hot isostatic pressing using a metal foil.
- 35 14. A method according to claim 13, wherein the first part is assembled with a metal foil that has previously been shaped to match the indentations of the inside face of the first part.

15. A method according to claim 13, wherein the foil forming the metal coating is made of a metal selected from niobium, molybdenum, tungsten, tantalum, and rhenium.

5 16. A method according to claim 1, wherein, prior to forming the metal coatings on said inside faces of the parts to be assembled together, treatment is performed to reduce the surface porosity of the thermostructural composite material on at least one of said inside faces.

10 17. A method according to claim 16, wherein said porosity-reducing treatment comprises: applying a suspension to at least one of said inside faces of the parts, the suspension comprising a ceramic powder and a ceramic material precursor
15 in solution, and transforming the precursor into ceramic material.

18. A method according to claim 17, wherein the ceramic material precursor is a polymer which is cross-linked and
20 transformed into ceramic by heat treatment.

19. A method according to claim 17, wherein, after transforming the precursor into ceramic material and prior to forming the metal coating, a ceramic deposit is made by
25 chemical vapor infiltration or deposition on said inside faces of the parts to be assembled together.

20. A method according to claim 1, wherein the parts to be assembled together are made of ceramic matrix composite
30 material.

21. A method according to claim 20, wherein the parts to be assembled together are made of ceramic matrix material in which the matrix is constituted at least in part by silicon
35 carbide.